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CABINET MOUNTAINS GRIZZLY BEAR MANAGEMENT STUDY

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ROCKY MOUNTAIN STATION

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ABSTRACT

An evaluation of the Kootenai National Forest was made to assess the grizzly bear management potential of the Forest. The principal areas evaluated concerned the eastern Cabinet Mountains and the eastern slope of the western Cabinet Mountains. The evaluation, based on the historical record of the grizzly in the Cabinet Mountains and a field examination of Kootenai National Forest, lead to the following conclusions:

1. That the eastern and western ranges of the Cabinet Mountains are capable of independently supporting viable populations of bears but only sparse populations exist at this time.

2. That there is little apparent exchange between the grizzly bear populations of the eastern and western Cabinet Mountains and thus the two areas should be managed independently.

3. That the core management area for the grizzlies of both the east and west Cabinet ranges lies in the alpine and forest zones above 5,000 feet elevation.

4. That only limited conflict need exist between management of the Cabinet Mountains for grizzlies and other resources. The rationale for this view is that the core management areas for the grizzly possess limited potential for timber management and undue contacts between bears and man can be prevented by managing the surrounding forest as a buffer zone and by controlling road access.

INTRODUCTION

This report presents an evaluation of portions of the Cabinet Mountains area as habitat for the grizzly bear (Ursus arctos horribilis) and proposes management recommendations. The specific portions of the Cabinet Mountains Wilderness included in the evaluation include the Troy, Cabinet, Libby, and Fisher Ranger Districts of the Kootenai National Forest. The study was performed under U. S. Forest Service Contract Number 262-46 awarded to the author on May 28, 1976.

The broad objectives of the study were:

1. To delineate the boundaries of an area within which grizzly bear management could be effected.

2. Within the areas established, to identify existing and potential seasonal key grizzly bear habitats and to propose management thereof.

3. To qualify, or rate, the grizzly bear habitat.

4. To assess the viability of the current population in the contract area.

The area evaluated in this report (Figure 1) included approximately 1050 square miles and is located in northwestern Montana. The area was bordered to the north by the Kootenai River and to the southwest by the Clark Fork River. The western boundary of the study area was the ridge line of the western Cabinet Mountains, the eastern and south boundaries were U. S. Highway No. 2 and the Vermillion River.

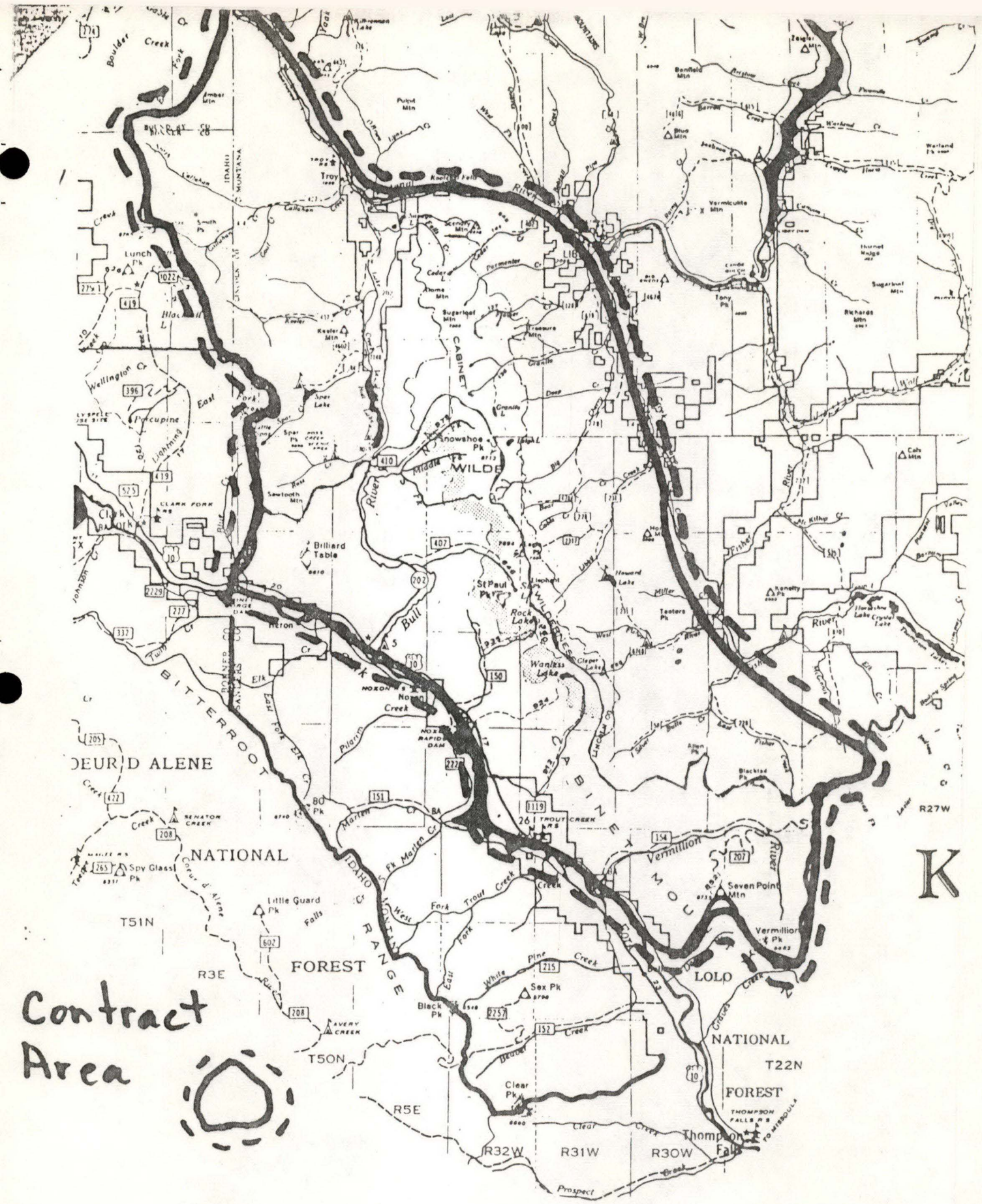

Figure 1. Study Area.

METHODS

The methodology employed in the development of this report concerned; a review of maps, reports and records of the Troy, Cabinet, Libby, and Fisher Ranger Districts; a five day field reconnaissance of the study area; a delineation of critical habitats by analysis of aerial photographs and vegetative type maps, and discussions of the project with officials of the U. S. Forest Service and the Montana Fish and Game Department.

The reports and records reviewed included:

1. Historical and recent records of the grizzly bear in the study area.
2. Vegetative type maps and aerial photographs.
3. Fire history and general cutover map.
4. Road development maps.
5. Elevation maps.
6. Habitat criteria report of the U. S. Forest Service for grizzly bear management.
7. Special grizzly survey of the Montana Fish and Game Department.

The field reconnaissance was conducted from August 30 through September 3, 1976. The 5-day reconnaissance entailed first a 2-hour aerial examination of the study area and of adjacent contiguous potential bear range. These potential areas included the western slope of the western range of the Cabinet Mountains and the areas of the Kaniksu and LoLo National Forests abutting with the study area to the south. This

reconnaissance provided the contractor general orientation and a first evaluation of the contract area as grizzly bear habitat.

The following five days were spent making vehicle and foot trips into the core of the study area as shown in Figure 2. Personnel participating in one or more of these trips included Messers. Bill Ruediger, Dave Morton, Jerry Hamilton, Gary Brimhall, Frank Carson, Bill Branham, Hank Newhouse, John Cox, Lance Schelvan, Dean Carrier, Jim Keniston and Dave Spores of the U. S. Forest Service, and Mr. Ken Knoche of the Montana Department of Fish and Game.

During these trips, the areas visited were closely searched for evidence of bear sign and evaluations were made of the attractiveness of the areas as grizzly bear habitat. Close searches were undertaken for evidence of bear sign; i.e. scats (fecal droppings), tracks, diggings, etc. Attention was likewise given in the field effort to judge the suitability of the study area as grizzly habitat on the base of current forest management practices and vegetational successional stages.

PAST AND RECENT EVIDENCE OF THE DISTRIBUTION AND ABUNDANCE OF THE GRIZZLY BEAR IN THE CABINET MOUNTAINS STUDY AREA

Only cursory information exists on the past or current status of the grizzly bear in the Cabinet Mountains. A total of 51 records of kills, sightings and sign observations were obtained from the Ranger Districts of the Kootenai Forest (Table 1). These records

Table 1. Observational Records of Grizzly Bears in the Cabinet Mountains.

	Date	Location	Observer	Remarks
1.	1956	Spar Lake Trail	E. Sells	Adult and 2 cubs
2.	1958	Halverson Creek	Bill Chapel	2 bear
3.	1959	Cliff Creek	Goat hunter	1 killed
4.	1962	West Fork Keeler Creek	E. Sells	2 adults
5.	1963	Ross Creek	E. Sells	Adult and 1 cub
6.	1963	Lake Darling	E. Sells	Adult and 1 cub
7.	1965	Star Mountain	E. Sells	Sign-droppings
8.	1965	C Alder Mountain	E. Sells	1 adult
9.	1966	Purdy Mountain	E. Sells	Sign-droppings
10.	1969	Roberts Mountain	A. Gibson	1 adult and 1 cub
11.	1970	Drift Creek	E. Sells	Adult
12.	1971	Roberts Mountain	J. Cox	Sign-tracks
13.	1971	Long Mountain	E. Sells	Adult
14.	1971	Ross Creek	E. Sells	Large adult
15.	1972	Hiatt Creek	Riedlinger	Adult
16.	1973	Roberts Mountain	A. Gibson	Tracks
17.	1973	South Callahan	A. Gibson	Sighting
18.	1973	Emerson Creek	Fowkes	Tracks
19.	1973	Raymond Creek	Fowkes	Tracks
20.	1975	Benning Creek	Sells	1 adult
21.	1976	Spar Lake	J. Shelley	1 adult
22.	1976	Callahan Creek	Newhouse	Tracks
23.	1976	Dry Fork Creek	Journey	Tracks
24.	1974	Spar Lake	Vance	1 yearling
25.	1976	Sq. Creek Peak	D. Morton	Tracks
26.	1972	North Fork Devils Club Cr.	Lee Razor	Tracks
27.	1976	" " " " "	D. Schreckenjoust	Tracks
28.	1970	Elephant Peak	?	Observation
29.	1976	Libby Lakes	?	Clawed tree
30.	1974	Twin Peaks	?	Bear den
31.	1975	Howard Lake	?	Observation
32.	1976	Little Hood Mountain	G. Altman	Observation-3 cubs
33.	1976	Lost Horse Mountain	Schelvin	Observation
34.	1955	Geiger Lakes	?	Observation
35.	1975	20 Odd Peaks	Miller	Observation-adult and 1 cub
36.	-	20 Odd Peaks	?	Sow and cub
37.	-	Baree Mountain	?	Observation
38.	1974	Baree Mountain	?	Kill in Cabinets
39.	1961	Wanless Lake	?	Observation
40.	1961	" "	?	"
41.	1964	" "	A. Cheney	Killed 3, wounded 1

Table 1. Observational Records of Grizzly Bears in the Cabinet Mountains (continued).

	Date	Location	Observer	Remarks
42.	1971	Rock Meadows	E. Belville	Tracks
43.	1976	Rock Lake	L. Runkki	Observation
44.	1976	Rock Meadows	?	-
45.	1976	Government Mountain	B. Cheshiser	Tracks
46.	1974	Twin Peaks	?	Observation
47.	1976	Cedar Lakes	Tom Bond	Observation
48.	1976	Minor Lake	Bert Ward	Tracks
49.	1968	Big Hoodoo Mountain	?	-
50.	?	Horse Mountain	?	-
51.	1976	Elephant Peak	?	Clawed tree

span the years 1956 through 1976. The bulk of the records are for the years since 1971. This is obviously the result of an enlarged effort to compile such data in recent years rather than an increased abundance of grizzlies. The fact that there were 14 records posted in 1976 does suggest, however, that a viable population of grizzly bears currently exists in the Cabinet Mountains. Unfortunately, the verocity of many of these records is subject to question. Many are reports of tracks and/or fecal droppings. These signs are easily confused with the signs of black bears. The observations of grizzly bears reported in some cases may also have been mis-identifications of black bears. Despite these reservations, the record of grizzlies in the Cabinet Mountains is sufficiently extensive to afford reasonable assurance that the species still exists in the area. There is no basis, however, upon which to base a meaningful population estimate. The last specimen record was in 1974 when a grizzly was taken during the legal hunting season. The species has been protected in the Cabinet Mountains since 1974.

As shown in Figure 3, the bulk of the records of grizzlies in the Cabinet Mountains study area cluster along the high mountain ridges in the study area. In the eastern Cabinets the records occur principally either within or directly adjacent to the Cabinet Wilderness area (Figure 3). Surprisingly, however, there are only two records for the north one-half of the eastern Cabinet range. Whether this is due to the real absence of grizzlies in this area or the result of

report bias is unknown. The latter is suspected to be the case, the likely reason being that this is a remote and difficult area of access. Consequently, there were reduced contacts with grizzlies in the area.

The records of grizzlies in the western Cabinet Mountain Range of the study area (Figure 3) are spread relatively uniformly throughout the upper elevations of the range. This suggests that the whole western range segment of the Cabinet Mountains is viable habitat for grizzly bears. Interestingly, about 90% of the records of grizzlies in the study area occur at elevations above 5000'. As will be shown beyond this elevation coincides reasonably well with the habitat types judged to be most important to the grizzly in the study area.

As discussed above, the distributional record of the grizzly in the study area shows two areas of major distribution. These center on the eastern and western ranges of the Cabinet Mountains, respectively. The absence of interconnecting grizzly records between the eastern and western Cabinet Mountain areas appears somewhat surprising. This could suggest that only limited exchanges of grizzlies occurs between the two areas. It is possible, however, that bears regularly interchange between the areas but for unknown reasons these crossovers are not reflected in the observation record.

EVIDENCE OF THE GRIZZLY FROM FIELD RECONNAISSANCE

The areas examined in the field for evidence of the grizzly are shown in Figure 2. Two areas were visited in the western Cabinet Mountain range. These included the Pillick Ridge area between Squaw Peak and Bull River; and Ross Point, Sawtooth Mountain and the Middle Mountain areas of the Dry and Ross Creek drainages.

In the Squaw Peak area and along upper Pillick Ridge 16 sign evidences of bears were found. These included 10 fecal groups (scats), several torn logs or stumps, and several claw-marked trees or sign markers. While some of this sign was doubtless that of black bears, several of the scats and claw markings were quite definitely grizzly. Two large scat piles contained principally elk hair and a clawed and rubbed tree contained a sizable amount of hair judged to be grizzly hair. No significant bear sign was observed within 1-1/2 miles of the juncture of Pillick trail with the Bull River. This area is quite heavily timbered and appeared to be relatively unattractive as grizzly bear range.

The evidence of bears observed in the Sawtooth Mountain and Ross Peak areas of Dry and Ross Creeks included 18 observations of sign. Most of this sign was old and only three scat groups were located. Most of the sign evidence encountered here was believed to be that of black bears although several areas of diggings were thought to be old signs of grizzlies. The low recent sign evidence of bears in this area was thought to be due to the sparse abundance of berries

present in the area at the time of our examination. The area did, however, have abundant attractive habitat along the upper elevations. The mid to lower reaches of both Ross and Dry Creek were heavy forest types relatively unattractive as grizzly habitat.

Areas of the eastern Cabinet Mountains examined for bear sign included the Rock Creek drainage; Baree Mountain and Silver Butte Creek; and the roaded reaches of Libby Creek, Ramsey Creek, Poorman Creek, Cable Creek, Bear Creek and Snowshoe Creek.

The examination of Rock Creek drainage for bear sign yielded only three evidences of bear sign none of which was judged to be that of grizzly bears. This field examination was confined to the valley region, however, and thus did not permit a search of the upper elevation areas where the major evidence of grizzlies might be expected to occur. Limited sign was also evidenced along the lower drainages of Libby Creek, Ramsey Creek, Poorman Creek, Cable and Bear Creek, Big Cherry, Snowshoe and Leigh Creeks. Here, too, the observations were confined to the lower roaded portions of the drainages in habitat relatively unattractive to bears generally and to grizzly bears in particular.

The final area examined included Silver Butte Creek and Baree Mountain and Baree Lake. Lower Silver Butte Creek is heavily forested and unattractive bear habitat. Conversely, the Baree Mountain and Baree Lake area appears to be superb grizzly habitat, primarily because of the openness of the country due to the 1910 burn and a variety of habitat features. The crop of blueberries extant at the time of

our visit to the area was the finest I have ever observed anywhere. The absence of bear sign in the area was thus difficult to explain. One possible explanation was that in the quite good berry year of 1976 bears had ready access to abundant food and thus may not have traveled extensively.

In sum the field reconnaissance as performed in this study revealed less evidence of grizzly bear sign than I would have expected on the basis of the overall apparent attractiveness of the Cabinet Mountains as judged from the aerial examination of the study area. The lack of observations is attributed to inadequate searches of the upper elevation zones of the study area. Future studies will have to concentrate on these areas in assessing the presence and abundance of grizzly bears in the Cabinet Mountains.

EVALUATION OF THE CABINET MOUNTAIN AREA AS GRIZZLY HABITAT

Three considerations bear on the suitability of the Cabinet Mountain study area as an area suitable for management of the grizzly. These include: (1) the spatial sufficiency of the area to satisfy the normal mobility traits of the species, (2) the support capabilities of the area for the grizzly, and (3) the compatibility of the grizzly with other resource uses of the area.

The following addresses each of these considerations.

SPATIAL SUFFICIENCY

In a previous study the author (Erickson, 1976) examined the spatial requirement of the grizzly as determined by various marking studies

(Berns and Hansel, 1972; Pearson, 1972; Craighead and Craighead, 1972) and the size of areas where relict populations of grizzly bears persist (Curry-Lindahl, 1972; Elkmork, 1962 and Leopold, 1958 and 1969) and arrived at the conclusion that the minimal spatial needs of the species should generally not exceed 50 square miles. The 1,050 square miles included in this study exceeds this area many times. However, all of the study area cannot be considered grizzly bear habitat. Assuming that such habitat is confined to those areas laying above 5,000 feet elevation, over 200 square miles of suitable grizzly habitat exists in the eastern Cabinet range and over 100 square miles along the eastern slope of the western Cabinet range included in this study. Consequently, both areas would appear to be sufficiently spacious to support a population of grizzlies. Further, with the addition of the western slope of the western Cabinet Mountains range the spatial area suitable for grizzlies in that range would be at least doubled.

There appears little doubt therefore that the Cabinet Mountains study area includes sufficient area to satisfy the mobility traits of the grizzly.

HABITAT EVALUATION

Figure 4 presents a generalized type map of the Cabinet Mountains contract evaluation area. This type map shows the bulk of the contract area as being vegetated by forest timber lands which would generally be considered minimally attractive as grizzly range (Erickson, 1974 and 1976; Mealey, 1977 and Mealey, Jonkel and DeMarchi, unpublished). The reason for this is that these forest

types provide relatively limited amounts of succulent grasses, sedges and herbaceous plant foods which provide the basic year-long food sustenance of the grizzly bear. The heavy (closed canopy) forest areas also provide limited amounts of seasonally important fruits and berry type foods or starchy underground plant parts.

Within the Cabinet Mountains, the principal areas providing these foraging areas for the grizzly are the alpine areas and the open or semi-open upper forest habitat types. These key areas include the entire alpine area, mountain meadows, sidehill parklands, upper stream draws and seep zones, and avalanche shoots. The forest types occurring in the Cabinet Mountains which have been identified as major foraging areas of grizzlies in Montana (Mealey, 1976 and 1977; and Mealey, Jonkel and DeMarchi, 1976) include Af/Clun (Abies lasiocarpa/Clintonia uniflora), AF/Vasc (Abies lasiocarpa/Vaccinium scoparium), Af/Xete (Abies lasiocarpa/Xerophyllum tenax), AF/Luhi (Abies lasiocarpa/Luzula hitchcockii), MH/Xete (Tsuga mertensiana/Xerophyllum tenax), WBP/AF (Pinus albicaulis/Abies lasiocarpa), DF/Xete (Pseudosuga menziesii/Xerophyllum tenax), and DF/Caru (Pseudosuga menziesii/Xerophyllum tenax).

In the main, these forest types and most of the habitat important to the grizzly bear in the Cabinet Mountains occurs above the 5,000' elevation level. Exceptions to this are avalanche shoots, some sidehill park areas, and the higher elevation burns and timber cuts adjoining the key upland grizzly habitat in the Cabinet Mountains.

Of the latter habitat areas attractive to the grizzly, the avalanche shoots and parkland areas are generally more or less perennially persisting areas of attractive bear habitat. The higher elevation cuts and burn areas laying within prime forest lands are attractive as grizzly habitat only during early successional stages. They are thus of only transitory interest to grizzlies as habitat and thus present unique management problems as will be discussed beyond.

CONFLICT PROBLEMS

A major consideration bearing on the development of a management plan for the grizzly in the Cabinet Mountains concerns potential conflicts between management of the grizzly bear and other uses of the Kootenai National Forest.

The obvious and most critical consideration is the compatibility of timber management and the grizzly. Happily, these two management uses do not appear to be in major conflict. As previously noted, both the distributional record of the grizzly and the habitat evaluation indicated that the key areas important for management of the grizzly in the Cabinet Mountains are the alpine areas and the high elevation forest zones.

These areas appear to be minimally important for timber management and thus no direct conflicts between timber and grizzly management should result. The removal of timber from what might be called the core management area for grizzly would, in fact, likely improve the core area for the grizzly. This judgement is based on the view that the

openings created by timber removals will be more attractive to the grizzly than the forest areas removed.

There are, however, two indirect effects of logging which may be considered indirect management conflicts. These concern timber removals in areas directly adjacent to the grizzly bear core management area and roading. Timber removals adjacent to the core management area have the potential of drawing bears from the core management area by the creation of openings and habitat types temporarily attractive to grizzlies. This, and the roads developed during logging serve to enlarge the contact association of bears with humans. This is not of itself derogatory to the bear except that enlarged human-induced mortalities usually occur as the result of this heightened contact. In essence, logging in the areas adjacent to the core management areas has the affect of removing the natural buffer separating bears from humans.

Fortunately, it appears possible to surmount these potential conflicts by varying the manner that timber removals are accomplished and by the management of access roads into the critical core management areas.

An additional potential management conflict problem of the grizzly in the Cabinet Mountains concerns mining. The Cabinet Mountains have been extensively prospected and a number of mining claims exist in the area. The possible future development of some of these claims will undoubtedly impose major impacts on the grizzly bear in the Cabinet

Mountains and accentuated mortalities can be expected due to increased human-bear contacts. The first intrusion would be the development of road access into the core management area. A second likely source of difficulty is the likelihood that bears will be drawn to mining sites by garbage refuse and/or by the purposeful feeding of bears. Both activities lead to the development of nuisance tendencies by bears and the resultant required removal of nuisance animals.

At the present time there are two major mining activities in the contract area. The first is in the Rock Creek drainage, an area of major mining activity in the past and an area where extensive explorations continue. In recognition of this highly mineralized area, a major exclusion was set into the Cabinet Mountains Wilderness area at the time of its establishment. There is little doubt that this intrusion poses a particular problem for the management of the grizzly in the eastern Cabinet Range. This would appear to be the case also for the Asarco mining site currently in development.

Beyond these identified conflict problems, no other grave conflicts were envisioned as regards management of the grizzly in the Cabinet Mountains. Undoubtedly, attention will have to be given to the placement of recreation sites, access roads and trails, private land in holdings, et cetera. Greater study will be required, however, before addressment of these potential conflicts can be addressed specifically.

SUMMARY EVALUATION OF THE CABINET MOUNTAINS AS HABITAT FOR THE GRIZZLY

As previously indicated in this report both the east and west ranges of the Cabinet Mountains appear capable of supporting grizzly bears. Further, the observational record indicates an extant population of grizzlies in both Cabinet ranges. The information on hand is too scant, however, to suggest a meaningful estimate of the current population. However, it seems unlikely that the current population numbers more than a few grizzly bears.

As regards the potential of the Kootenai Forest for the management of the grizzly, I view this as quite favorable. The areas of importance for management of the grizzly bear are the upper elevations of the eastern and western Cabinet ranges. The core ridge complexes of both of these ranges adjoin heavy timber stands at their lower elevations. These forest stands are relatively unattractive habitat for grizzlies and thus serve as a behavioral buffer to the out movements of bears from the central mountain management areas except as encroached upon by extensive timber cutting, mining and road development. These activities appear to pose the principal constraints to the management of the grizzly in the Cabinet Mountains. This is not to imply that timber harvest, mining or roads are of themselves detrimental to the grizzly bear. Rather these activities tend to violate the integrity of the central mountain complexes as critical bear habitat by (1) destroying the buffer effect of the lower elevation forests, and (2) by increasing human-bear contacts. Positive management of the grizzly on the Kootenai Forest thus entails diminishing these impacts.

One of the objectives of the contract was to evaluate the Cabinet Mountains contract area as habitat for the grizzly. This evaluation is necessarily judgemental inasmuch as few data exist on which to base an evaluation. Despite this reservation, I feel reasonably certain that the Cabinet Mountain ranges as currented vegetated provide reasonably attractive grizzly range equivalent to that extant in the Bob Marshall Wilderness and similar forested areas over which the grizzly is currently distributed in the intermountain west. The area cannot be considered equivalent to grizzly bear range of the types present in parts of Yellowstone Park, or on the Alaska Peninsula or Kodiak Island. This assessment concerns habitat per se and not the relationship of habitat and other factors bearing on the welfare of the species, including the amount of habitat available. It appears likely, however, that the current attractiveness of the Cabinet Mountains as grizzly habitat is diminished over earlier periods. The basis for this judgement is the apparent reduced amount of open areas due to the vigorous suppression of forest fires over the last several decades. Fires in the upper mountain areas serve to suppress forest incursion and thus maintain earlier successionals stages which provide greater food abundances for the grizzly.

MANAGEMENT OF THE GRIZZLY IN THE CABINET MOUNTAINS

Management Area and Recommendations

Figure 5 presents the area delineated as tentatively recommended for management of the grizzly in the Cabinet Mountains contract area at this time. This area encompasses (1) over 90 percent of the observa-

tional record of grizzly bears in the Kootenai Forest, (2) the high elevation alpine and other openland habitat types providing the base support needs of the grizzly, and (3) the forest habitat types providing key seasonal forage.

The management area as delineated is perhaps somewhat excessive. For the most part the really important habitat for the grizzly in the Cabinet Mountains appears to be above the 5,000 foot elevational contour. However, both the east and west Cabinet ranges are penetrated by a number of stream draws. As a consequence, the eastern and western faces of the east and west ranges of the Cabinet Mountains are comprised of a series of ridge fingers and interlocking stream draws. These draws are without doubt used to some extent by grizzly bears, particularly the upper reaches. There is a further rationale for identifying these draws as areas to be managed for the grizzly. This is that commercial timber stands occur throughout the length of the draws. As a consequence, timber harvest and roading has extended to the upper elevation limit of many of the draws. These actions have broken the natural buffer which formerly existed between the prime Cabinet Mountains grizzly ranges and man. Thus the security of the grizzly in the Cabinet Mountains has been and continues to be eroded by enlarged contacts of grizzlies with man. It is thus recommended that early steps be taken to arrest and reverse this process. Possible corrective steps would include changing the order of the forest cuts in the areas recommended for management, and controlling road access.

As concerns timber harvest, cuts to this time have been of a patch work nature extending throughout the whole elevational range of the commercial forests. This patchiness and interconnecting roads have served to extend the range of the grizzly downslope from the perennial extant high ranges. To preclude this development it is proposed that future cuts be accomplished in a sequential zone or belt pattern. The belts cut would then be permitted a regenerative period before the next belt was cut. The effect of this would be only short term disruption of the lower forest buffer. The belt or zone cuts could precede either downslope or upslope, although road management would be eased by preceeding downslope.

The problem of road management into the area delineated for management of the grizzly is primarily a problem of curtailing vehicular access of persons into the key central management area. It is likely, however, that bears will also be inclined to use the roads as travel lanes. Consideration should therefore be given to seeding the upper road reaches with alders or other woody trees or shrubs. This would discourage the use of the roads as travel lane. The road bed could be later easily opened by a bull dozer if required.

As earlier noted, mining activities also constitute a management problem in the Cabinet Mountains. Besides breaking the integrity of the central grizzly management area, mining activities, cabins, camping and recreational sites are often a source of difficulty with bears due to bears being attracted to these areas by garbage refuse or purposeful feeding.

To the extent possible, close control of food refuse should be practiced. Further, camp sites should be placed well away from the central grizzly management area, if at all possible.

The above has principally addressed management considerations for the grizzly in the forest zone extending below the core management areas. In the main, the core areas in the Cabinet Mountains lie above 5,000'. Relatively little commercial timber exists at these upper elevations so only limited silvicultural activity is likely to occur in these areas. Further, in the eastern Cabinets the bulk of the management area delineated falls within the Cabinet Mountains Wilderness. Although open habitat types constitute a significant portion of the upper zones of the eastern and western Cabinets the openness of these habitats appears to have been markedly reduced due to forest incursion as the result of intensive fire control. To increase the attractiveness of this core management area, it is recommended that consideration be given either to instituting some controlled burning or exercising less rigorous control of natural fires in these areas. These actions would enhance the attractiveness of the core management area for the grizzly thus raising the support potential for the species and lessening the likelihood of out-movements by bears.

Three final points of concern relative to the grizzlies of the contract areas relate (1) to the several minor areas of potential grizzly habitat in the contract area which are somewhat separated from the central eastern or western Cabinet Mountains, (2) to the interrelation-

ship of the grizzlies in the eastern and western Cabinet ranges, and (3) the relation of these stocks to grizzly populations adjacent to the contract area.

The satellite management areas located within the contract area include: the Horse Mountain area of the eastern Cabinet range; the Goat Mountain and Robert's Mountain areas of the western Cabinets; and the Berray Mountain and Government Mountain areas as possible crossover connections between the eastern and western Cabinet Mountains.

At the moment, any attempt to integrate the potential grizzly habitat of the Horse Mountain area (Figure 5) with the eastern Cabinet Mountains would appear to be questionable. While there are records of grizzly bears in the area the amount of suitable habitat in the area is only about 12 square miles and the area is separated by about two miles from the eastern Cabinets. Consequently, a large amount of area would require specific management to incorporate this limited area and thus the effort seems hardly warranted. Conversely, integration of the Goat Mountain and Robert's Mountain areas of the western Cabinets appears workable by virtue of their near adjacency to the core management areas.

The desirability of attempting to develop a crossover area between the eastern and western Cabinet ranges appears questionable at this time. As noted earlier there is only limited evidence of crossovers of bears between the two ranges at this time. This suggests that the eastern and western Cabinet ranges are individually viable as management areas for the grizzly. Assuming this to be the case I would be

disinclined to attempt to integrate the areas. The rationale for this view concerns the likely problems associated with bears crossing through the Bull River area. Besides a major highway there is considerable other human activity in this area. Enlarged consequent mortalities of bears in the area can thus be expected if regular use of the areas by bears should develop.

As regards possible crossover areas two routes appear most likely. These include the Barrey Mountain area and the Government Mountain area. Currently, both areas exist as potential satellite management areas of the eastern Cabinet range. However, to discourage crossovers between the two ranges, I would suggest that both areas be managed as buffer areas rather than core range until such time as greater information is available relative to the extent of travel by bears between the east and west ranges of the Cabinet Mountains. Meantime, provision should be made for the possible later delineation of crossover zones passing between the eastern and western Cabinet Mountains ranges via the Barrey and Government Mountain area.

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